

Serial Number: Unknown

Filing Date: Herewith

Title: SCANNING PHASE MEASURING METHOD AND SYSTEM FOR AN OBJECT AT A VISION STATION

REMARKS

Claims 15, 18, and 26 of the patent have been amended to correct typographical errors. New claims 28-85 have been added to more fully describe the invention described in the patent. Eighty-five claims remain for consideration.

Five new independent claims, 30, 42, 56, 60, and 72, have been added. Claims 30, 42, 60, and 72 remove the limitation to moving “at a substantially constant velocity” as was found in issued claims 1 and 14. Claim 56 addresses the invention of the optical head, without reciting other portions of the system apparatus. These new claims are supported by claims 1 and 14 of the original application, by Figure 2, by column 4 lines 10-18, and by the abstract lines 1-8, and numerous other places in the specification. Applicant respectfully submits that, due to error which arose without any deceptive intent on the part of Applicant, the original patent is partially inoperative by reason of claiming more or less than the patentee had a right to claim. In particular, the claims of the patent unnecessarily include limitations in the independent claims to moving “at a substantially constant velocity” and having a detector having a plurality of separate detector elements “which are substantially uniformly spaced,” which limitations are not required to distinguish over the cited prior art.

By removing these limitations, the new claims are broader than the issued claims in one or more respects. However, the present reissue application is being filed within two years from the grant of the original patent, pursuant to 35 U.S.C. §251. Further, other limitations, not present in the original claims of the application, were added to these new claims, and thus the recapture rule has not been violated. *Ball Corp. v. U.S.*, 221 USPQ 289, 295 (Fed. Cir. 1984). The new claims distinguish over the references cited in the original patent, and thus appear in condition for allowance, and such action is respectfully requested.

SUPPORT FOR THE NEW CLAIMS

New method claims 30 and 60 address using a light pattern, and are supported by claims 1 and 2 and the abstract lines 1-8 of the patent. New apparatus claims 42 and 72 address using a light pattern, and are supported by claims 14 and 15 and the abstract lines 1-8 of the patent.

New claims 28-29, 32, 44, 62, and 74 recite moving in a direction perpendicular to the optical axis, and wherein the projected pattern of light is a stripe of lines, and are supported on column 4 lines 23-25 of the patent, and claims 3 and 16 of the patent.

New claims 31, 43, 61, and 73 recite detector elements having a plurality of pixel elements, and are supported on column 3 lines 56-58 of the patent.

New claims 33, 45, 63, and 75 recite computing a height of the surface of the object, and are supported on column 6 lines 40-54 of the patent, and claims 4 and 17 of the patent.

New claims 34, 47, 64, and 77 recite a spacing between the first and second detector element is substantially equal to a corresponding spacing between the second and the third detector element, and wherein the step of moving is performed at a substantially uniform velocity, and are supported on column 3 lines 56-58 of the patent, and claims 1, 6, 14, and 19 of the patent.

New claims 35, 48, 65, and 78 recite registering the images, and are supported on column 4 lines 50-52 of the patent.

New claims 36, 49, 66, and 79 recite detector elements are elongated in a direction parallel to a detector axis of the detector; the detector also has an optical element having an optical axis; and the drive moves the object relative to the first projector in a direction substantially perpendicular to the detector axis and substantially perpendicular to the optical axis, and are supported on column 4 lines 28-31 of the patent.

New claims 37, 50, 59, 67, and 80 recite the detector includes a tri-linear array camera, and are supported on column 3 lines 54-55 of the patent.

New claims 38, 51, 68, and 81 recite each detector element includes a row of CCD sensing elements extending substantially parallel to the detector axis and wherein the step of moving is performed in a direction substantially perpendicular to the rows of the CCD sensing elements, and are supported on column 3 lines 54-55 of the patent, and column 4 lines 28-31 of the patent.

New claims 39 and 69 recite projecting with two projected patterns of light, and are supported on column 6 lines 54-67 of the patent.

New claims 40 and 70 recite cycling the object relative to the two projected patterns of

Serial Number: Unknown

Filing Date: Herewith

Title: SCANNING PHASE MEASURING METHOD AND SYSTEM FOR AN OBJECT AT A VISION STATION

light, and wherein the two projected patterns of light are alternately projected, and are supported on column 6 line 66 to column 7 line 1 of the patent.

New claims 41 and 71 recite the two projected patterns of light are alternately projected during consecutive scans, and are supported on column 6 line 64-66 of the patent.

New claims 52 and 82 recite a second projector, the first and second projectors projecting the pattern of light, and are supported on column 6 line 61-66 of the patent.

New claims 53 and 83 recite the drive cycles the object relative to the two projectors wherein the two projectors alternately project the pattern of light during consecutive cycles, and are supported on column 6 line 66 to column 7 line 1 of the patent.

New claims 54 and 84 recite the two projectors alternately project the pattern of light during consecutive scans of the projected pattern of light, and are supported on column 6 line 64-66 of the patent.

New claims 55 and 85 recite the projector and the detector define at least part of an optical head, and are supported on column 6 line 64-66 of the patent.

New claim 57 recites a drive that moves the object relative to the projector at the vision station so as to scan the projected pattern of light across a surface of the object to generate an imagable light signal, and is supported on column 3 lines 48-50 of the patent.

New claim 58 recites a computational element coupled to the detector that computes the dimensional information associated with the object based on the first, second, and third image values, and is supported on column 3 lines 43-44 and column 6 lines 40-48 of the patent.

A total of 7 independent claims and a total of 85 claims remain for consideration. A check for the fees of the reissue examination for 6 independent and 85 total claims is attached. The Examiner is authorized to charge any additional fees due or credit any overpayment to deposit account 19-0743.

Serial Number: Unknown

Filing Date: Herewith

Title: SCANNING PHASE MEASURING METHOD AND SYSTEM FOR AN OBJECT AT A VISION STATION

CONCLUSION

Applicant believes that all claims are in condition for allowance. Consideration of the amended and new claims for reissue and allowance of all eighty-five claims is respectfully requested. The Examiner is invited to contact the Applicant's attorney if prosecution of the present reissue application can be assisted thereby.

Respectfully submitted,
Leonard H. Bieman

By his Representatives,

SCHWEGMAN, LUNDBERG, WOESSNER & KLUTH, P.A.
P.O. Box 2938
Minneapolis, MN 55402
(612) 373-6949

Date 8 July 1998 By Charles A. Lemaire
Charles A. Lemaire
Reg. No. 36,198

"Express Mail" mailing label no. EM 287849 544 US

Date of Deposit: 8 July 1998

I hereby certify that this paper or fee is being deposited with the United States Postal Service as "Express Mail Post Office to Addressee" service under 37 CFR 1.10 on the date indicated above and in an envelope addressed to Assistant Commissioner for Patents, Washington, D.C. 20231.

Charles A. Lemaire
(Name)

Charles A. Lemaire
(Signature)

8 July 1998
(date)